

Remarks

Claims 1, 2, 4-13, 18, 19, 21-23, 27 and 28 are pending in the subject application. By this Amendment, claims 4 and 21 have been amended. No new matter has been introduced by these amendments. Upon entry of these amendments, claims 1, 2, 4-13, 18, 19, 21-23, 27, and 28 will be before the Examiner. Favorable consideration of the pending claims is respectfully requested.

Claims 4 and 21 are rejected under 35 U.S.C. §112, second paragraph, as being indefinite. Applicants believe the above amendments have obviated this rejection. Reconsideration is respectfully requested.

Claims 1, 2, 4-10, 12, 18, 19, 21, 22, and 27 are rejected under 35 U.S.C. §102 (a) and (b) as being anticipated by Lehmann *et al.* (IDS: Sensor 2003 Proceedings, 157-161). Applicants respectfully request reconsideration, and in support submit herewith (1) a Certificate of Accuracy from Anne Shreiner of Transperfect Translations, (2) the Declaration of Uwe Lehmann, and (3) the Declaration of Dr. Lars Birken. Applicants respectfully assert that these declarations and the certificate of accuracy perfect Applicants' claim to priority, which predates the October 2003 publication date of the cited reference. Paragraphs 7-9 of the Declaration of Uwe Lehmann, co-author of the cited reference, establish that the earliest possible publication date of the cited reference was in October, 2003. The priority date to which the subject application is entitled is January 16, 2003. Priority is perfected by virtue of the Declaration of Dr. Birken, which establishes that original German application DE103 01 601.5 filed on January 16, 2003, was identical to International Application PCT/DE2004/000035 filed on January 14, 2004. Upon entering the U.S. National Phase, Dr. Birken instructed Applicants' undersigned counsel to obtain an English language translation of PCT/DE2004/000035 as filed. Undersigned counsel contacted Transperfect Translations to obtain the English language translation, which corresponds to International Publication No. WO2004/065955 A1, the English language translation of which is certified as accurate by Transperfect Translation (Certificate of Accuracy of Anne Shreiner). Undersigned counsel filed the translation obtained from Transperfect Translations as the subject application. Accordingly, the subject application is a certified accurate English translation of the German applications to which it claims priority. Because the subject application's priority date is 9 months before the earliest

possible publication date of the cited reference, the cited reference is not available as prior art. Accordingly, Applicants respectfully request withdrawal of this rejection.

Next, claims 18, 19, and 21-23 are rejected under 35 U.S.C. §102(b) as being anticipated by Jones (U.S. Patent No. 3,916,465; Figures 1-3 and U.S. Patent No. 3,800,602) for reasons set forth in paragraph 6 at page 3 of the Action. Applicants respectfully traverse. Jones is directed to a conventional gas chromatograph. In contrast, the claimed invention is to a miniaturized gas chromatograph. Although there are no specific dimensions recited in the pending claims, the term “miniaturized” is well known and widely recognized by those skilled in the art as defining a very different type of gas chromatograph from what is disclosed in Jones ‘465 and Jones ‘602. The accompanying Declaration of Uwe Lehmann, particularly paragraphs 4-6, explains these specific, well-recognized differences between conventional gas chromatographs and miniaturized gas chromatographs, and further explains why any functional or manufacturing characteristics cannot be transferred by the ordinary skilled artisan from one type of gas chromatograph to the other. To one of ordinary skill in the art, the term “miniaturized” gas chromatograph defines the device as one being no larger than 1 cm<sup>3</sup>. Thus the patentability inquiry must begin with the realization that miniaturized gas chromatographs are a distinct, art-recognized class of devices that are three or more orders of magnitude smaller than conventional gas chromatographs. While they might perform some similar functions, Jones’ conventional gas chromatographs can neither anticipate nor render obvious the claimed miniaturized gas chromatographs. They are not merely conventional devices of conventional materials, but shrunken; rather, they are of vastly different materials and manufactured in vastly different ways.

For example, conventional gas chromatographs have much larger external dimensions than miniaturized gas chromatographs (three or more orders of magnitude). Conventional gas chromatographs are manufactured using conventional techniques like casting, bending, welding, soldering, milling, and the like. Conventional gas chromatographs are made from materials like stainless steel, glass, and plastics using such manufacturing techniques. As a particular example, the Teflon “clad” of Jones that is cited in the Office Action cannot possibly be adapted to a miniaturized gas chromatograph as it is far too thick.

In contrast, miniaturized gas chromatographs use manufacturing techniques known from integrated circuit production like microchips and the like. These so called micromachined or micro mechanical systems are manufactured using such semiconductor device fabrication technologies including wet etching, dry etching, electro discharge machining, and photolithographic techniques. As is readily apparent, these manufacturing techniques are of significant difference from the conventional techniques used for conventional gas chromatographs. Further, the semi-conductor device fabrication technologies used for the miniaturized gas chromatographs require specific materials to be used, namely silicon, to allow for the bonding process which is required to produce products having complicated geometries. These significant differences find basis in a number of characteristics of the subject claims, e.g., in claim 18 and those dependent therefrom, examples are the sheet with channels and the plasma polymerized plastic layer. Thus, the ordinary skilled artisan would clearly understand the claimed miniaturized gas chromatographs to be completely different devices from anything taught or suggested by Jones '465 or Jones '602. Accordingly, Applicants respectfully request reconsideration and withdrawal of this rejection.

Claims 1, 2, 4, 6-13, 27, and 28 are next rejected under 35 U.S.C. §103(a) as being obvious over Jones (U.S. Patent No. 3,916,465: Figures 1-3 or U.S. Patent No. 3,800,602) in view of Lehmann *et al.* (IDS: Sensor Proceedings II, 2001, 487-492) for reasons set forth at page 4-6 of the Action. Applicants respectfully traverse. The shortcomings of the Jones references have been set forth above. They're directed to completely different classes of devices, using completely different materials, and completely different manufacturing techniques. One skilled in the art of Jones is not the same as the ordinary skilled artisan in the field of the subject invention. Contrary to what is asserted at page 5 of the Office Action, it is not obvious to one having ordinary skill in the art to merely reduce the size of the Jones devices. It cannot be disputed that one of ordinary skill in Jones' art does not have the technical grasp to produce the miniaturized gas chromatographs of the claimed invention. A change in size may well be within the level of ordinary skill in the art if it is only a mere downsizing of elements using the same materials and manufacturing techniques taught in the cited reference. However, the invention part of the subject application has elements that are so miniaturized, neither the materials nor the manufacturing techniques used for conventional gas chromatographs could possibly be used for the miniaturized gas chromatographs claimed herein. In

fact, the Jones references are so different as to constitute non-analogous art which the ordinary artisan would not find useful or suggestive when contemplating the subject invention. Further, the assertions that claim 4 (and claims 18 and 21) are product-by-process claims where patentability depends on the recited product, not on its method of production is only partially correct. The assertion fails to take into account the fact that a plasma polymerized layer by definition effects specific characteristics of the product manufactured by the process; the plasma polymerized layer will be an extremely thin layer to a degree not possibly contemplated or suggested by the cited references, and incorporating one of the explicitly mentioned materials recited in the claim. These inherent structural distinctions must be accorded adequate weight. Because the inherent, art-recognized characteristics of the claimed invention are not taught by the primary references, they do not render the subject claims obvious.

The secondary reference, Lehmann *et al.* (2001), fails to cure these deficiencies and one would not be motivated to combine references teaching the manufacture of conventional gas chromatographs with those teaching miniaturized gas chromatographs. Applicants further note that the Office Action disregards important aspects of claims 27 and 28. First, from Lehmann *et al.* (2001) one cannot conclude the reference implicitly discloses that a control and evaluation unit will have to be present on the device of Lehmann. There is one important aspect which would hinder the skilled person to configure the miniaturized gas chromatograph in such a way: this is the fact that at least the separation column, and usually the injector and the detector as well, must be heated to a specific temperature to conduct the analysis. This temperature is known by the skilled artisan to be rather high, and claim 27 comprises several characteristics directed to a heating element and a temperature control for this purpose. Any electronic components comprised in an electronic control and evaluation unit, however, will be adversely affected by such a heat and this will result in that an ordinary person will not place an electronic control and evaluation unit on a circuit board if a separation column detector and injector requiring such a heating element is placed on such circuit board. Last, it is important to note that this specific measure of placing both the control and the column, the injector and the detector on the circuit board is only possible because of the plurality of recesses provided to protect the electronic control and evaluation unit from the heat emitted by these heating elements. None of the prior art documents discloses this specific measure as claimed in claim

27. Accordingly, reconsideration and withdrawal of this rejection is respectfully requested.

Finally, claim 5 remains rejected under 35 U.S.C. §103 (a) as being obvious over Jones (U.S. Patent No. 3,916,465; Figures 1-3 or U.S. Patent No. 3,800,602) in view of Lehmann *et al.* (IDS: Sensor Proceedings II, 2001, 487-492), and further in view of Lehmann *et al.* (IDS: Micro Total Analysis system, 2000, 167-170) for reasons set forth in paragraph 11 at page 6 of the Action. Applicants respectfully request reconsideration. The deficiencies of the Jones references have been set forth above. They are directed to a completely different class of devices than those disclosed in the Lehmann *et al.* (2001) and Lehmann *et al.* (2000) secondary and tertiary references. One of ordinary skill in the art would not look to combine these teachings because the methods of manufacture used are completely different, to the point where they amount to non-analogous art. It is unreasonable to assert that an ordinary artisan would look first to Jones, then choose to modify any of the Jones elements by miniaturizing them a thousand fold or more and making them of silicon. Accordingly, Applicants request that this rejection be withdrawn.

In view of the foregoing remarks and amendments to the claims, Applicants believe that the claims as currently pending are in condition for allowance, and such action is respectfully requested.

Applicants invite the Examiner to call the undersigned if clarification is needed on any of this response, or if the Examiner believes a telephonic interview would expedite the prosecution of the subject application to completion.

The Commissioner is hereby authorized to charge any fees under 37 C.F.R. §§ 1.16 or 1.17 as required by this paper to Deposit Account 19-0065.

Respectfully submitted,



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Attachments: Certificate of Accuracy  
Transperfect English translation of WO 2004/065955  
Declaration of Uwe Lehmann  
Declaration of Lars Birken